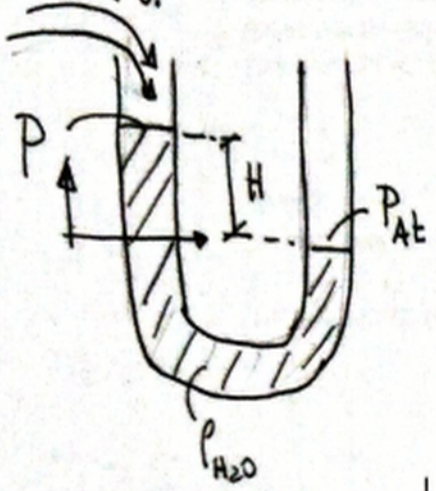
EMI ESCUELA MILITAR DE INGENIERÍA "Mcal. Antonio José de Sucre" Prestigio. Disciplina y Mejores Oportunidades	**PRIMER PARCIAL** **SOLUCIONARIO DEL EXAMEN (MOSOL)**	
CARRERA: CIENCIAS BASICAS	**ASIGNATURA:** FÍSICA II	**FECHA:** 3/09/2021
CURSO: SEGUNDO SEMESTRE	**DOCENTE:** LIC. JOSE LUIS MAMANI CERVANTES LIC. CESAR VLADIMIR ARANCIBIA CARBAJAL	
UNIDADES TEMÁTICAS A EVALUAR	**1.- Mecánica de Fluidos** **2.- Elasticidad**	

RESOLUCION DEL EXAMEN

P-1



$P_{At} > P$

Aire ⇒ Dinamica de fluidos

$$P + \frac{1}{2}\rho_A v^2 + \rho_A g H = P_{At} + \frac{1}{2}\rho_A v_1^2 + \rho_A g y$$

$$P_{At} - P = \frac{1}{2}\rho_A v^2 + \rho_A g H \quad \ldots\ldots (1)$$

tubo Estatica de fluidos ($P_{At} > P$)

$$P_{At} = P + \rho_{H_2O} g H$$

$$P_{At} - P = \rho_{H_2O} g H \quad \ldots\ldots (2)$$

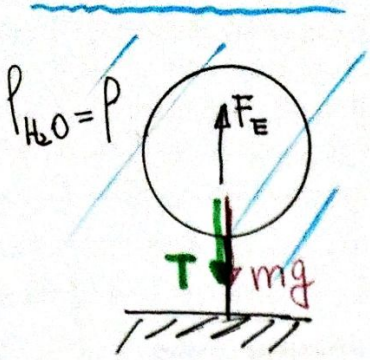
Ec. (1) = (2)

$$\frac{1}{2}\rho_A v^2 + \rho_A g H = \rho_{H_2O} g H$$

$$g H (\rho_{H_2O} - \rho_A) = \frac{1}{2}\rho_A v^2 \Rightarrow H = \frac{\frac{1}{2}\rho_A v^2}{g(\rho_{H_2O} - \rho_A)} = \frac{\frac{1}{2}(1,2)(15)^2}{9,8(1000 - 1,2)}$$

$$\therefore \boxed{H = 0,0137\,m}$$ Sol.

P-2



$$\uparrow \sum F_y = 0$$

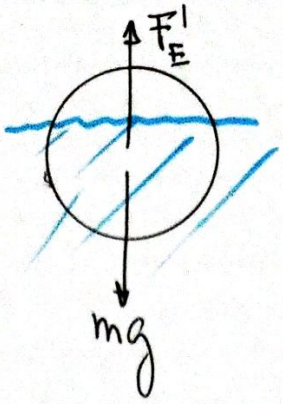
$$F_E - T - mg = 0$$

$$\rho_f V_{f.d.} g - T = mg$$

$$m = \rho V - \frac{T}{g}$$

$$m = 1000(0,5) - \frac{980}{9,8}$$

$$m = 400\ kg$$



$$\uparrow \sum F_y = 0$$

$$F_E' - mg = 0$$

$$\rho_f V_{f.d.} g = mg$$

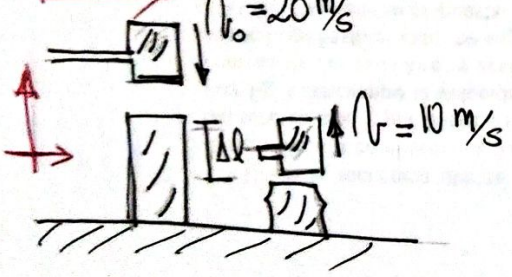
$$V' = \frac{m}{\rho} = \frac{400}{1000}$$

$$V' = 0,4\ m^3$$

$$f_{rac}\% = \frac{V'}{V_{esf}} = \frac{0,4}{0,5} * 100$$

$$f_{rac}\% = 80\%$$ Sol.

P-3



$$\frac{F_\perp}{A} = Y\frac{\Delta l}{l} \Rightarrow \frac{\Delta l}{l} = \frac{F_\perp}{AY} = \frac{4F_\perp}{\pi d^2 Y} \quad ---(1)$$

Por la segunda ley de Newton

$$F_N = \frac{dP}{dt} = \frac{d}{dt}(mv) = m\frac{dv}{dt} = m\frac{\Delta v}{\Delta t}$$

$$F_N = F_\perp = \frac{m}{\Delta t}(v_f - v_i) = \frac{m}{\Delta t}(v - (-v_0))$$

$$F_\perp = \frac{m}{\Delta t}(v + v_0) \quad ---(2)$$

Ec. (2) en (1)

$$\hookrightarrow \frac{\Delta l}{l} = \frac{4}{\pi d^2 Y}\left[\frac{m}{\Delta t}(v + v_0)\right] = \frac{4 \cdot 30\,(10+20)}{\pi (0,023)^2 (20\times10^{10})(0,11)} \Rightarrow \frac{\Delta l}{l} = 9,85\times10^{-5}$$ Sol.

P-4

$$\rho = \frac{m}{V} \qquad m = \rho_0 V_0 \qquad \Delta V = V - V_0 \qquad V = \Delta V + V_0$$

$$\frac{\Delta V}{V_0} = -k\rho$$

$$\rho(h) = \frac{\rho_0 V_0}{\Delta V + V_0} = \frac{\rho_0}{\frac{\Delta V}{V_0} + 1} = \frac{\rho_0}{1 - k\rho}$$

$$P = -\frac{1}{k}\frac{\Delta V}{V_0}$$

$$\rho = \frac{1030}{1 - (45,8\times10^{-11})(1\times10^7)} = 1035\ kg/m^3$$

$\rho_0 < \rho$

Sol.